Chapter 2

Pharmaceutical spending trends and future challenges

Across OECD countries, pharmaceutical spending reached around USD 800 billion in 2013, accounting for about 20% of total health spending on average when pharmaceutical consumption in hospital is added to the purchase of pharmaceutical drugs in the retail sector. This chapter looks at recent trends in pharmaceutical spending across OECD countries. It examines the drivers of recent spending trends, highlighting differences across therapeutic classes. It shows that while the consumption of medicines continues to increase and to push pharmaceutical spending up, cost-containment policies and patent expiries of a number of top-selling products have put downward pressure on pharmaceutical prices in recent years. This resulted in a slower pace of growth over the past decade.

The chapter then looks at emerging challenges for policy makers in the management of pharmaceutical spending. The proliferation of high-cost specialty medicines will be a major driver of health spending growth in the coming years. While some of these medicines bring great benefits to patients, others provide only marginal improvements. This challenges the efficiency of pharmaceutical spending.

Introduction

Pharmaceutical spending across OECD countries reached around USD 800 billion in 2013, accounting for about 20% of total health spending on average when pharmaceutical consumption in hospitals is added to the purchase of pharmaceutical drugs in the retail sector. Retail pharmaceutical spending growth has slowed down in most OECD countries in the last decade, while spending on pharmaceuticals used in hospital has increased in most countries where this information is available. Current market developments, such as the multiplication of high-cost medicines targeting small populations and/or complex conditions, have prompted new debates on the sustainability and efficiency of pharmaceutical spending. Will OECD countries be able to afford access to these high-cost medicines to all patients who need them and at what price? Will they get value for the money they will spend?

This chapter looks first at recent trends in pharmaceutical spending and financing across OECD countries. Then, it examines the drivers of recent spending trends, highlighting differences across drug classes. Finally, it focuses on current and predicted trends in pharmaceutical markets and associated challenges in the management of pharmaceutical expenditure.

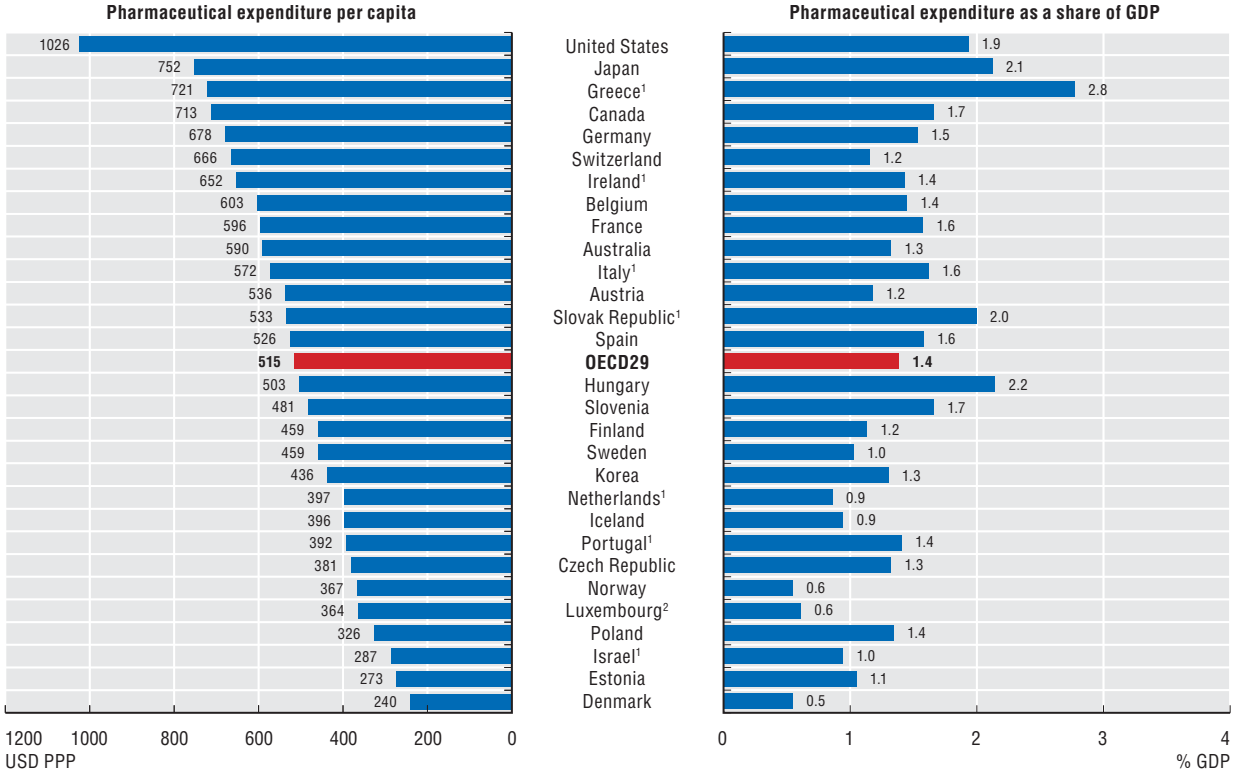
One in every five health dollars is spent on pharmaceuticals

In 2013, OECD countries spent an average of more than 500 USD per person on retail pharmaceuticals[1] (Figure 2.1). In the United States, the level of spending was twice the OECD average, and more than 35% higher than in Japan, the next highest spender. At the other end of the scale, Denmark spent less than half the OECD average.

The data on pharmaceutical spending shown in Figure 2.1 only include those purchased in the *retail* sector, as many countries are not able to supply data on the cost of pharmaceuticals consumed in hospitals and other health care facilities. In those countries that are able to supply these data, the inclusion of pharmaceutical expenditure in hospital and other facilities adds another 10% on top of the retail pharmaceutical spending in the case of Germany, Canada and Australia, and more than 25% in countries such as Spain, Czech Republic and Portugal (Figure 2.2). Such differences stem from the budgetary and distributional channels within a country. On average, the use of pharmaceuticals in hospitals and other health care facilities raises the pharmaceutical bill by around 20%, meaning that a little more than one health dollar in five goes towards purchasing pharmaceuticals.

Prior to 2005, spending on retail pharmaceuticals grew at a faster rate than other key components of health care, such as inpatient and outpatient care, and was a major contributor in driving up overall health expenditures (see Figure 2.3). Over the subsequent decade, however, retail pharmaceutical spending growth was seriously affected by patent expiries of several blockbuster drugs and cost-containment policies, particularly as a consequence of the economic crisis. As a result, retail pharmaceutical spending decreased dramatically in some countries, for example in Portugal, Denmark and Greece.

Figure 2.1. **Expenditure on retail pharmaceuticals per capita and as a share of GDP, 2013 (or nearest year)**



1. Includes medical non-durables.
2. Excludes over-the-counter drugs (OTC).

Source: OECD Health Statistics 2015

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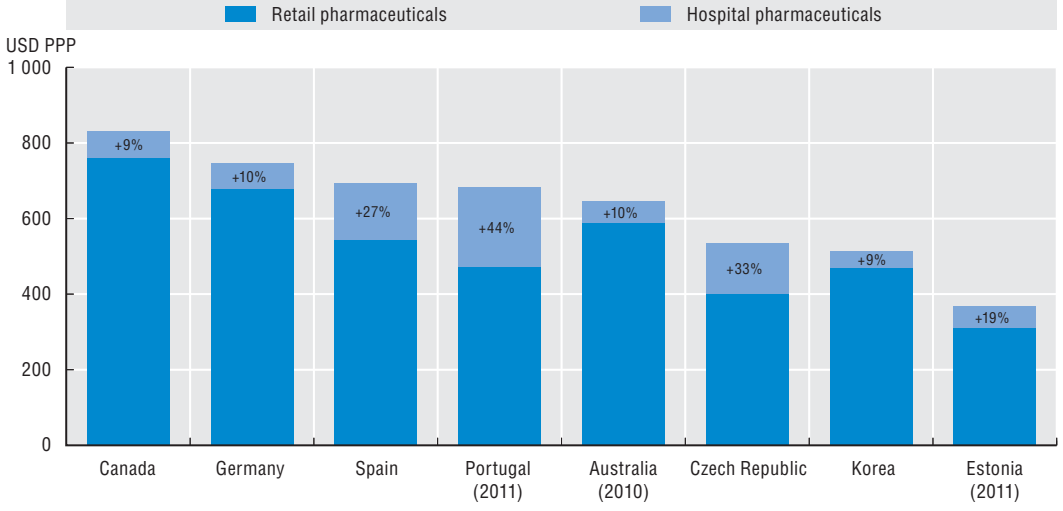
Figure 2.2. **Total (retail and hospital) pharmaceutical spending, per capita USD PPP, 2013 (or nearest year)**



Note: Data for Portugal are OECD estimates based on adjusted total and retail pharmaceutical spending figures.

Source: OECD Health Statistics 2015.

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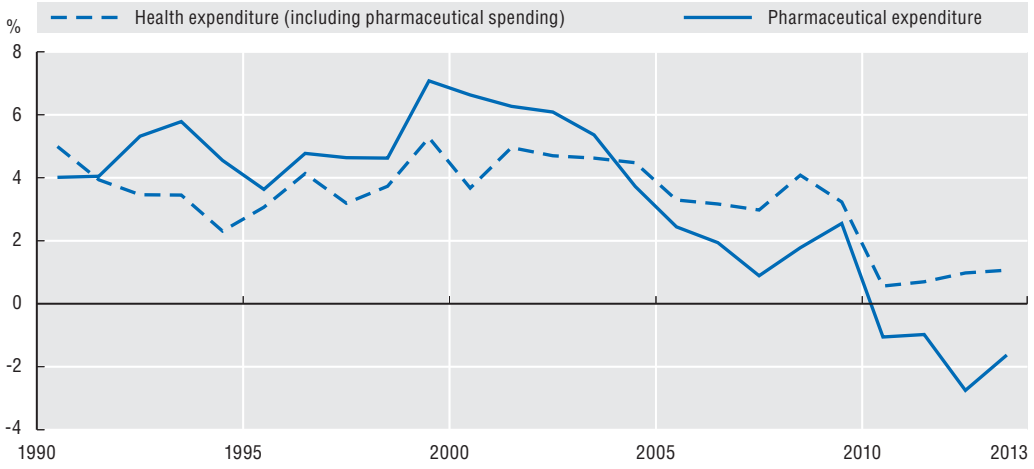
Figure 2.3. **Average annual growth in pharmaceutical and total health expenditure per capita, in real terms, average across OECD countries, 1990 to 2013 (or nearest year)**



Source: OECD Health Statistics 2015.

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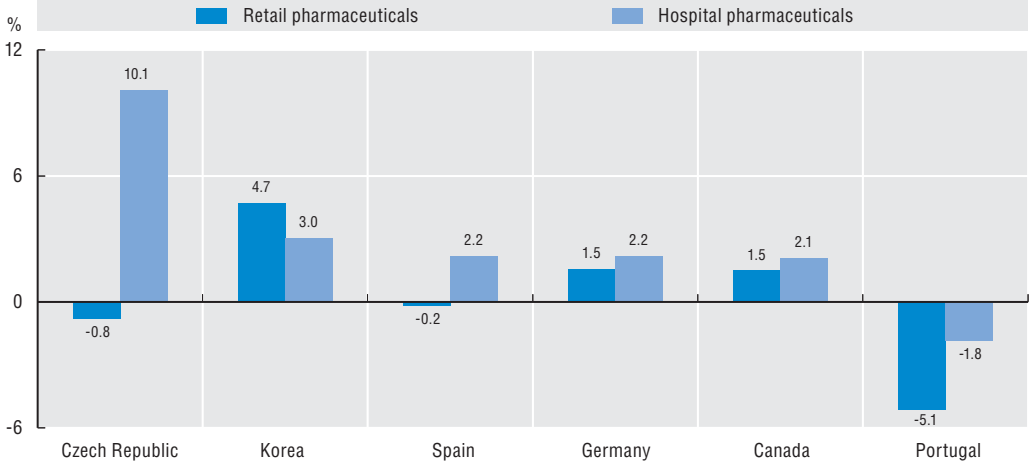
Over the same period, spending on hospital medicines grew faster in several countries (see Figure 2.4). The multiplication of specialty drugs[2] offers a partial explanation, as these are often delivered in a hospital setting (including in an outpatient department) rather than dispensed via pharmacies (Hirsch et al., 2014) and are coming to the market with increasingly high prices.

Figure 2.4. **Annual average growth in retail and hospital pharmaceutical expenditure, in real terms, 2005 and 2013 (or nearest year)**



Note: OECD estimates for Portugal exclude expenditure on other medical products from reported total and retail spending.
Source: OECD Health Statistics 2015.

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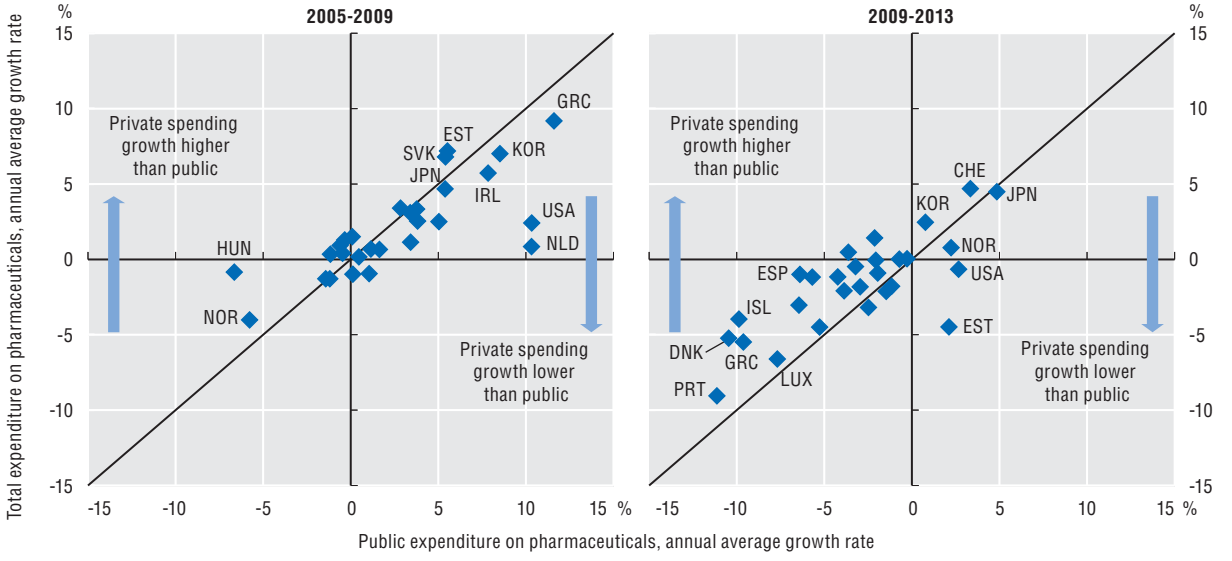
The share of private funding of pharmaceuticals increases

Private funding in the purchasing of pharmaceuticals is greater than for other categories of health care. On average in OECD countries, 43% of retail pharmaceutical

spending is paid for from private sources (private health insurance or out-of-pocket), compared with 21% for inpatient and outpatient care. Most of the private spending for drugs (37%) comes directly from households' pockets, reflecting both the high cost-sharing requirements and the extent of self-consumption of over-the-counter (OTC) medicines (see the indicator on pharmaceutical expenditure in Chapter 10). Countries such as France, Germany and Japan report a relatively low private share of pharmaceutical spending of around 25-30%, whereas the United States and Canada (both countries where private health insurance plays a large role in financing pharmaceutical spending), as well as Poland (where spending on OTC drugs is significant), all report more than 60% of the pharmaceutical bill being covered by private sources.

In a majority of OECD countries, private spending on pharmaceuticals has grown faster than public spending over the last decade (Figure 2.5). In particular, since 2009, private spending on drugs did not decline to the same extent as public spending. This is due in part to an observed shift of some of the cost-burden to households. For example, in Hungary, the out-of-pocket share of spending on prescribed medicines rose from 40% to 45% between 2010 and 2013 (Figure 2.6). The Czech Republic and Slovak Republic also reported increases in the households' share of medicines to 38% and 33% respectively.

Figure 2.5. **Annual growth in public and total retail pharmaceutical spending, OECD countries, 2005-2013**



Source: OECD Health Statistics 2015.

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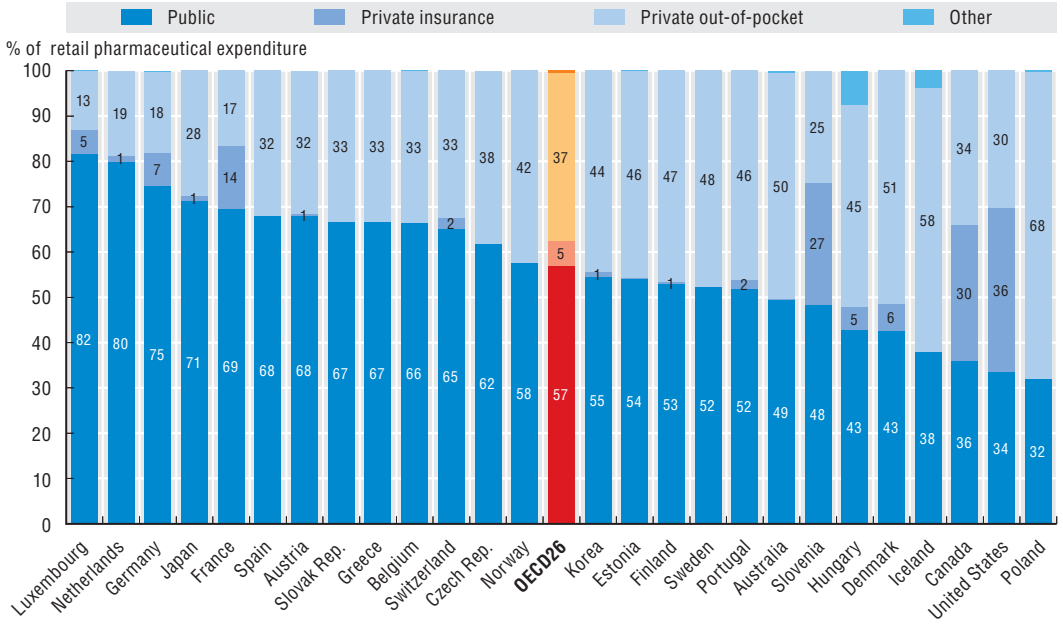
The trends in public and private spending are partly explained by a range of policy measures adopted by countries to contain public spending on pharmaceuticals, such as increases in cost-sharing, as well as the increasing use of OTC drugs (usually not reimbursed) compared with prescription drugs (usually reimbursed) in several countries. In Slovenia, Poland and Spain, the OTC share of pharmaceutical spending has significantly increased.

Figure 2.6. **Expenditure on retail pharmaceuticals by type of financing, 2013 (or nearest year)**



Source: OECD Health Statistics 2015.

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Pharmaceutical expenditure growth is driven by changes in quantity, prices and therapeutic mix

The increasing demand for medicines and the introduction of new drugs into the market are the main drivers of spending growth. At the same time, the availability of generics and biosimilars combined with the introduction and strengthening of cost-containment policies have exerted a downward pressure on spending in recent years (Belloni et al., forthcoming).

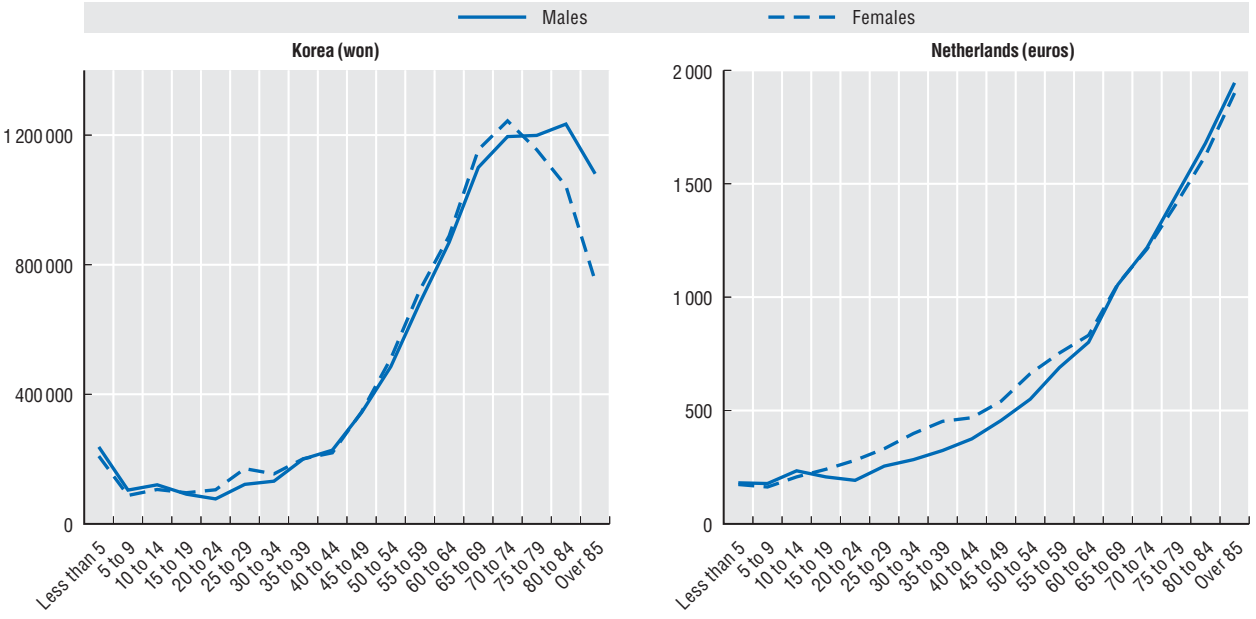
An increasing demand for pharmaceuticals and new treatment opportunities push pharmaceutical spending up

The quantity of drugs consumed has increased over time in many therapeutic classes. Between 2000 and 2013, among countries for which data are available, the use of antihypertensive, antidiabetic and anti-depressant medications nearly doubled, while the use of cholesterol-lowering drugs tripled (see indicator on "Pharmaceutical consumption" in Chapter 10). These trends reflect an increasing demand for pharmaceuticals, resulting from the rising prevalence of chronic diseases, population ageing, changes in clinical practices and coverage extensions, as well as new treatment opportunities.

The prevalence of many chronic diseases, such as cancer, diabetes and mental illness has increased, leading to an increased demand for medical treatments. Improvements in diagnosis, leading to earlier recognition of conditions and earlier treatment with medicines, as well as the development of more medicines (both prescribed and OTC) to treat common conditions have also contributed to increase the consumption of medicines.

Population ageing also increases the demand for pharmaceutical treatments. With age, the tendency to develop health conditions which require some kind of medication increases. As shown in Figure 2.7 for Korea and the Netherlands, per capita spending on pharmaceuticals increases rapidly with age.

Figure 2.7. **Per capita spending on retail pharmaceuticals by age, Korea and the Netherlands, 2011**



Source: OECD Database on Expenditure by Disease, Age and Gender (unpublished).

StatLink http://dx.doi.org/10.1787/888933280694

New and innovative drugs expand treatment options and increase treatment costs. New drugs can be new chemical entities or new formulations of existing drugs. Both categories may increase treatment options, for instance, for previously unmet needs or for new population targets (e.g. children), increasing the quantity of drugs consumed. While the approval of new drugs in existing market segments can increase competition and lead to potential savings, usually new drugs offering therapeutic advantages for patients are priced higher than their competitors and contribute significantly to pharmaceutical spending growth.

In recent years, the proliferation of specialty pharmaceuticals with high prices, in particular oral cancer drugs and immune modulators,[3] has played an increasing role in pharmaceutical spending growth (Express Scripts, 2015; Trish et al., 2014). In the United States, specialty drugs represented just 1% of total prescriptions but accounted for 25% of total prescription drug spending in 2012 (Express Scripts, 2015).

Changes in clinical practice guidelines also influence the consumption of pharmaceuticals upward. Updated guidelines have often recommended earlier treatments, higher dosages or longer treatment durations for secondary prevention or management of chronic diseases, leading to increases in volume consumed. This is the case for instance for guidelines for cholesterol-lowering drugs (e.g. statins), one of the fastest-growing therapeutic classes of prescription drugs all over the world. Prescription guidelines have been updated several times since the end of the 1990s, recommending wider screening and lower lipid level targets as an indication for prescription in Canada, the United Kingdom and the United States (CIHI, 2012; ACC/AHA, 2014; NICE, 2014).

In a few countries, *coverage expansion* has contributed to pharmaceutical spending growth. In the United States, Medicare Part D was introduced in 2006 and the Affordable Care Act was implemented in 2014, contributing to a substantial reduction in the number of people uninsured. In Korea, with the establishment of the National Health Insurance

(NHI) in 1989 and successive steps in coverage expansion, pharmaceutical spending increased rapidly – at a rate of more than 10% each year on average between 2000 and 2004 (Yang et al., 2008) and continued to grow since then, albeit at a slower rate.

Cost-containment policies and patent losses have put downward pressure on spending growth

Pharmaceutical policies have the potential to influence spending trends and the efficiency (cost-effectiveness) of pharmaceutical spending. In recent years, and in particular after the economic crisis in 2008, OECD countries have implemented or strengthened a number of cost-containment policies (Table 2.1).

Table 2.1. **Pharmaceutical cost-containment policies introduced since 2008 in a selection of OECD countries**

Policies	Examples	Extent of implementation
Pricing policies	One-off cut in ex-factory prices of on-patent medicines	Austria, Belgium, Czech Republic, France, Germany, Greece, Ireland, Italy, Portugal, Spain, Switzerland, United Kingdom
	Implementation of external price referencing or change in the method or basket of countries	Greece, Portugal, Slovak Republic, Spain, Switzerland
	Reduction in value-added tax (VAT) rates	Austria, Czech Republic, Greece
	Reduction of mark-ups for distributors	Czech Republic, Estonia, Greece, Hungary, Ireland, Portugal, Spain
	Increase of rebates paid by manufacturers or distributors	Germany
	Extra-ordinary price reviews	Greece, Ireland, Portugal, Slovak Republic, Spain, Switzerland
	Pressure on prices of branded medicines (e.g. group purchasing or negotiation)	Canada
Reimbursement policies	Change in the reference price system (max. reimbursement price by cluster)	Estonia, Greece, Ireland, Portugal, Slovak Republic, Spain
	Delisting of products	Czech Republic, Greece, Ireland, Portugal, Spain
	Increase in cost-sharing	Austria, Czech Republic, Estonia, France, Greece, Ireland, Italy, Portugal, Slovenia, Slovak Republic, Spain, Sweden
	Introduction of health-technology assessment (HTA) to inform coverage/pricing decisions	Germany
	Managed-entry agreements	Belgium, Italy, United Kingdom
Policies to exploit the potential of off-patent drugs	Implementation of voluntary or mandatory International Non-proprietary Name (INN) prescribing	Belgium, Estonia, France, Italy, Luxembourg, Portugal, Slovak Republic, Spain
	Incentives for physicians to prescribe generics	Belgium, France, Greece, Hungary, Japan
	Incentives for pharmacists to dispense generics	Belgium, France, Ireland, Japan
	Incentives and information for patients to purchase generics	Austria, Estonia, France, Iceland, Ireland, Luxembourg, Portugal, Spain
	Pressure on generic prices (e.g. tendering, price cuts)	Canada, France, Greece, Portugal

Source: Belloni et al. (forthcoming), complemented by Thomson et al. (2014) on cost-sharing policies.

Since 2008, price cuts have been very common. At least one third of OECD countries implemented measures to reduce regulated prices of pharmaceuticals. They most often imposed cuts on ex-factory prices of on-patent and/or generic drugs (e.g. Greece, Ireland, Portugal and Spain), but many of these countries also reduced distribution margins at least for some categories of medicines. Germany increased temporarily the mandatory rebates imposed on pharmaceutical companies from 6% to 16% between 2010 and 2013. In April 2014, the mandatory rebate was set at 7% for all medicines except generics. In Canada, several provinces and territories entered in joint price negotiations for brand-name drugs covered by public plans. Finally, five countries changed VAT rates imposed on

medicine, either to reduce pharmaceutical spending (e.g. Austria, Czech Republic and Greece) or to increase public revenues (e.g. Estonia, Portugal) resulting in increased spending.

Greece, Portugal, the Slovak Republic, Spain and Switzerland reformed their *external reference price system*, expanding or reducing the basket of countries used for international benchmarking or revising the method for setting prices. For example, the Slovak Republic included Greece in the basket of benchmarked countries in 2010.

A range of policy measures have *shifted some of the burden of pharmaceutical spending to private payers* (households or complementary private insurance). These rarely took the form of delisting products (i.e. excluding them from reimbursement), with the notable exceptions of Greece, where 49 medicines were delisted after a price review in 2011, Czech Republic, Ireland, Portugal and Spain. At least a dozen of countries introduced or increased user charges for retail prescription drugs (Austria, Czech Republic, Estonia, France, Greece, Ireland, Italy, Portugal, Slovak Republic, Slovenia, Spain and Sweden) (see Thomson et al., 2014; and Belloni et al., forthcoming).

Some countries decided *to give a greater role to health technology assessment (HTA)* in their reimbursement and/or pricing process. In Germany, for instance, a new law, which took effect in January 2011, introduced a systematic and formal assessment of the "added therapeutic benefit" of new medicines after market entry to allow negotiation of a reimbursement price where needed. Expected savings for health insurance funds are up to several million Euros for some individual products (Henschke, 2013).

In parallel, many OECD countries have introduced or expanded the use of *managed entry agreements* (MEAs), which are arrangements between the manufacturer and the payer that allow coverage of drugs subject to defined conditions. Managed-entry agreements cover a wide range of contractual arrangements, which can be just financial or performance-based (i.e. reimbursement and pricing conditions are linked to observed performance of a product in real life). They take the form of price-volume agreements, coverage with evidence development, performance-based outcome guarantees, patient access scheme, etc. Their implementation varies across countries. The United Kingdom, Italy, Germany and Poland have taken the lead in using these arrangements (Ferrario and Kanavos, 2013). In Italy, the amounts recouped by the government from manufacturers through performance-based arrangements are modest and represent 5% of total expenditure for the relevant indications. This is due, at least partly, to high administrative and management costs of the scheme (Garattini et al., 2015, Navarria et al., 2015, van de Vooren et al., 2014). Their impact in other jurisdictions has not yet been evaluated.

Since the onset of the economic crisis, several countries have *strengthened their generic policies* (see Table 2.1 and Figures 10.12 and 10.13 in Chapter 10). While no formal evaluation is available, these policies – associated with the "patent cliff" – have certainly contributed to the significant increase in the generic market share observed over the past decade in most countries.

From the mid-2000s, *a number of blockbuster drugs lost patent protection*, contributing to the decline of pharmaceutical spending growth. Several products worth more than USD 30 billion a year in US sales lost their patents in 2011-12, among which Plavix® (antiplatelet agent), Lipitor® (anti-cholesterol) and Actos® (diabetes), which accounted together for nearly USD 15 billion in sales (Managed Care, 2011).

Patent expiries offer huge opportunities to make savings without affecting the quality of care. In the United States, for instance, where the generic market is very dynamic, the

price of a generic drug is on average 80 to 85 % lower than that of the brand name product. In 2012, 84% of all prescriptions filled in the United States were for generic drugs (IMS Institute for Healthcare Informatics, 2013, see also indicator on "Share of generic market" in Chapter 10).

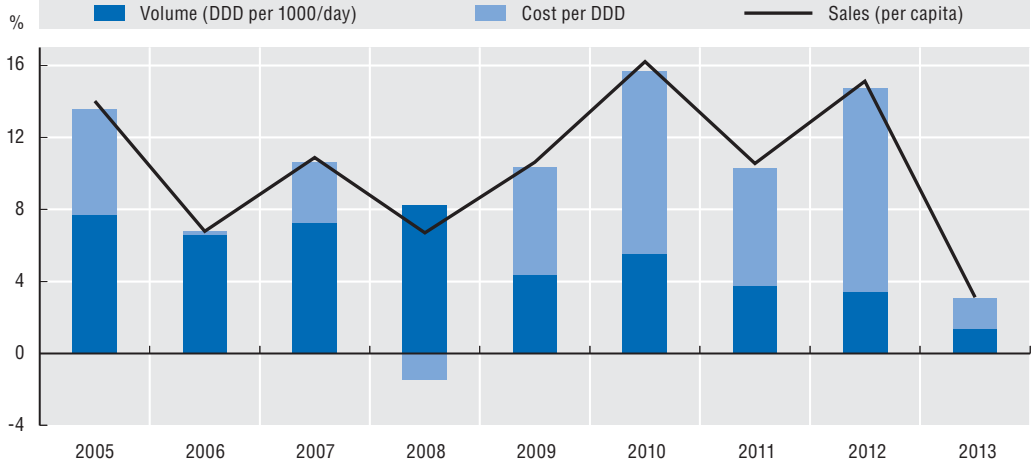
Biosimilars can also lead to significant savings, although the potential is perhaps not as high as with generics of small molecules, due to longer and costlier development and production costs. Entry barriers are higher: Europe established a pathway for the approval of biosimilars in 2005, Japan approved biosimilars' regulation in 2009 and Korea in 2010. The United States approved the legislative framework for licensing follow-on biologic products in 2010, but the FDA only recently approved the first biosimilar in March 2015. In addition, countries' regulations often restrict market growth potential and price competition. In many countries, prescribing by International Non-proprietary Names (INN) is not allowed, patients cannot be switched to a biosimilar and substitution by the pharmacist is not allowed (European Biopharmaceutical Enterprises, 2015).

Drivers of spending growth vary across therapeutic areas

All the drivers of spending growth listed before interact differently across therapeutic classes, leading to contrasting trends.

In the case of antidiabetic medicines for instance, where use has been steadily increasing in line with the increasing prevalence of type-2 diabetes, the existence of long-standing treatments with generic versions resulted in a 'cost of treatment' which remained relatively stable over a number of years. However, the arrival of new and more expensive treatments in recent years significantly increased the average daily treatment cost. The shift from existing medications to new drugs has therefore been the main contributor to pharmaceutical spending growth in this therapeutic class in the recent period, as shown for Denmark between 2005 and 2013 in Figure 2.8.

Figure 2.8. **Annual growth in sales, volumes and cost per defined daily dosage (DDD) of antidiabetic drugs, Denmark, 2005-13**

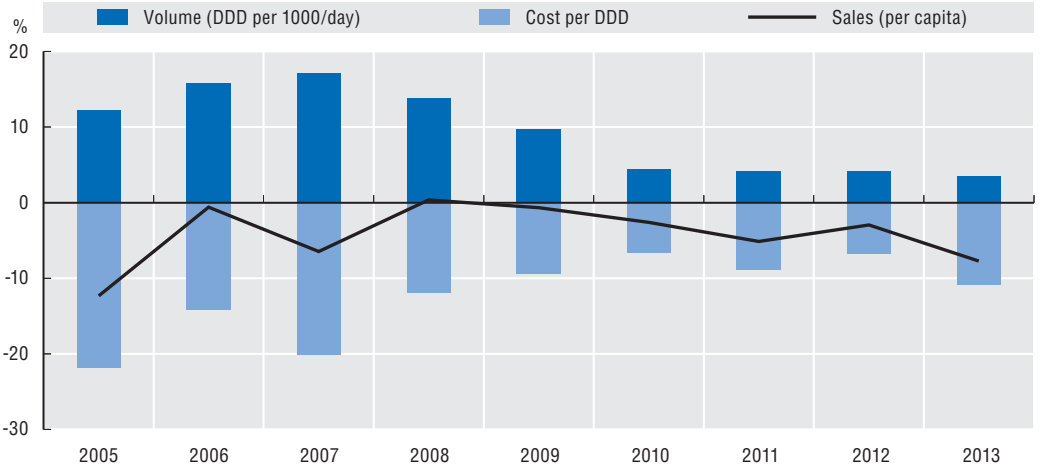


Source: OECD Health Statistics 2015.

StatLink http://dx.doi.org/10.1787/888933280701

By contrast, in the class of cholesterol lowering medications, the expiry of the patent for some of the top selling statins in the mid-2000s and the introduction of generics has led to a pattern of decreasing treatment costs in many countries in recent years. For example, costs per defined daily dose (DDD) typically fell by more than 10% per year, on average, since 2005 in Germany (Figure 2.9).

Figure 2.9. **Annual growth in sales, volumes and cost per defined daily dosage (DDD) of lipid-lowering drugs, Germany, 2005-13**



Source: OECD Health Statistics 2015.

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The high price of new drugs has been the main driver of spending growth in other therapeutic areas.

In the area of **cancer** for instance, the price of specialty medicines has steadily increased, especially since 2000. In the United States, the median monthly price of cancer treatment for Medicare patients has increased from around USD 5 000 in 2000-05 to around USD 10 000 in 2010-15.[4] In 2012, 12 out of 13 cancer-approved drugs cost more than USD 100 000 per year (Light and Kantarjian, 2013). These price increases are observed everywhere. In Australia, the average reimbursement price per anticancer prescription drug more than doubled in real terms between 1999-2000 and 2011-12, while the price of all other prescription drugs only increased by about one-third during that period (Karikios et al., 2014).

Treatment costs for **multiple sclerosis and pulmonary hypertension** are also very high and increasing (Lotvin et al., 2014). The first generation of multiple sclerosis therapies, originally costing USD 8 000 to USD 11 000 per year in 1993-96, now cost about USD 60 000 per year, reflecting an increase five to seven times higher than prescription drug inflation over the period 1993-2013. Newer therapies entered the market with a cost 25%-60% higher than existing ones (Hartung et al., 2015).

In 2013 and 2014, new treatments for **hepatitis C** became available, posing an unprecedented challenge to many OECD countries. These medicines represent a great medical advancement: they are much better tolerated than previous treatments and reach cure rates of 95% or higher for sub-groups of patients with hepatitis C. For these target groups, these treatments are even cost-effective. The immediate budget impact of treating the entire population affected proved to be unaffordable for OECD countries, due to high prices and high prevalence of the disease. In reaction, many countries sought to reach

agreements with manufacturers to limit the budget impact and to recommend priority use for the most severely affected patients, generating frustration for physicians, patients and decision makers alike.

Orphan drugs[5] also typically have high prices. The median cost per patient and per year is 19 times higher for an orphan drug than for a non-orphan drug (EvaluatePharma, 2014). The premium for ultra-rare indications is very high. The number of newly approved molecular entities classified as orphans has been increasing since the implementation of policies designed to encourage their development and medicines with orphan designation now account for one-third of new chemical entities approved by the FDA (IMS Institute for Healthcare Informatics, 2014).

New challenges in the pharmaceutical market

Changes in the pharmaceutical market, with the increased availability of high-cost drugs, suggest that future pharmaceutical spending growth may pick up again, instead of continuing its recent path, at least in some countries. Countries will face a number of challenges to make new high-cost medicines available to patients, contain spending growth and ensure value for money.

The IMS Institute for Healthcare Informatics predicts worldwide pharmaceutical sales[6] to be 30% higher in 2018 than in 2013 (IMS Institute for Healthcare Informatics, 2014). The average annual growth rate is slightly higher than in previous years due to a smaller number of patent expiries and a higher number of new specialty drugs. Emerging markets, in addition to the United States, are expected to contribute most of this growth, while European markets will make more modest contributions.

The United States is the largest pharmaceutical market, accounting for one third of global sales, and is expected to continue to grow. The IMS Institute for Healthcare Informatics predicted peaks in US spending growth of 14% in 2014 and 8% in 2015, followed by annual growth rates of 4-5% until 2018. According to CMS projections, prescription drug spending is expected to grow at an average annual rate of over 6% per year between 2016 and 2024 (Keehan, 2015).

The largest European markets are predicted to experience lower levels of growth. According to the IMS Institute for Healthcare Informatics, the top 5 European markets (Germany, France, the United Kingdom, Italy and Spain) will see annual growth rates of between 1 and 4% during the period 2014 to 2018. Pharmaceutical spending in the United Kingdom and Germany should experience the highest growth, while France and Spain will have zero to negative growth (IMS Institute for Healthcare Informatics, 2014). In an earlier study, Urbinati et al. (2014) had predicted a decrease in pharmaceutical spending in all European countries studied – except Poland – between 2012 and 2016.

Specialty drugs will continue to be a major contributor to pharmaceutical spending growth. Since 2010, one out of every two FDA approvals is a specialty drug and, as the population ages, the number of patients eligible for specialty drugs such as treatments for rheumatoid arthritis and cancer is increasing (Lotvin et al., 2014). Increased spending on these drugs is projected to account for 53% of total growth in North America between 2013 and 2018, while in Europe it is expected to account for 94% of the (much slower) growth over the same period (IMS Institute for Healthcare Informatics, 2014). The huge contribution of specialty medicines to pharmaceutical spending growth is explained by the fact that there will be more of them, priced at very high levels, with more patients needing them.

Cancer is the therapeutic area with the highest expected spending growth, driven by new drug approvals and the increasing incidence of cancer worldwide (IMS Institute for Healthcare Informatics, 2014). Many orphan drugs approvals are also expected in the years to come. Their predicted budget impact by 2020 in several European countries ranges from 4-5% to 9-11% of pharmaceutical spending, depending on the success rate of products in development (Schey et al., 2011; Hutchings et al., 2014). Another study estimated that the share of orphan drugs in the worldwide pharmaceutical market for non-generic prescription drugs is expected to increase from 14% in 2014 to 19% in 2020 (EvaluatePharma, 2014).

High prices of drugs are an important barrier to access, and this does not concern developing countries only. The results of a recent survey conducted among policy makers (reported in WHO, 2015) show that policy makers in European countries consider the high price of drugs as the main challenge to provide access to new medicines given the budgetary constraints they have. Many drugs, including drugs providing important benefits, are not available at all, or not accessible to all patients who need them. For example, as already noted, a lot of countries restricted access to the new hepatitis C treatments to the most severely affected patients and a few countries have not yet reimbursed the new medicines at all (e.g. Poland).

A further challenge is that high prices of new medicines do not always appear to be justified by high clinical benefits (Howard et al., 2015; Light and Kantarjian, 2013). For example, many new cancer drugs provide small added benefits over existing ones. Among the 12 new anticancer drugs approved by the FDA in 2012, only one provides survival gains that exceed two months. Sometimes cancer drugs are used for several indications with varying levels of efficacy, but the price is usually unique (Bach, 2014). Examining the launch prices of cancer drugs approved between 1995 and 2013, Howard et al. (2015) observed that patients and insurers paid USD 54 100 for a year of life gained in 1995, USD 139 100 a decade later and USD 207 000 in 2013 for the same benefit (in constant 2013 dollars, adjusting earlier costs for inflation).

Similarly, many orphan drugs do not pass the test of cost-effectiveness. In the Netherlands, medicines used for the treatment of Pompe's and Fabry's disease have been assessed to cost several million Euros per QALY gained, which triggered a discussion about the opportunity to maintain health insurance coverage of these products. However, they were not delisted, since these medicines are used for severe diseases for which no alternative treatment is available (van den Brink, 2014).

Conclusions

Retail pharmaceutical spending has increased at a slower pace than before or even decreased in recent years due to patent losses of several blockbusters and cost-containment policies, while pharmaceutical spending in hospital has increased in most countries for which data are available.

New high-cost specialty drugs are coming to the market and are expected to account for 50% or more of pharmaceutical spending growth in the near future. Their increasing availability, combined with population ageing, suggests that pharmaceutical expenditure may pick up again after the recent stagnation or decline.

Pharmaceutical spending growth is not necessarily a problem in itself. Medicines play an important role in the management of a number of chronic diseases (e.g. diabetes, asthma) and, in some circumstances, they prevent complications and the use of costly health care services. However, the increasing availability and sky-rocketing prices of new

medicines, especially in cancer, hepatitis C, pulmonary hypertension and multiple sclerosis, or for rare diseases, have raised a number of questions about accessibility, budget impact and the legitimacy of such high prices.

While some of these high-price medicines bring great benefits to patients, others provide only marginal improvement of patients' outcomes. In reality, prices seem more determined by market conditions (high unmet medical need, small population target) than by any conception of value in terms of clinical or wider benefits for patients. Many of these medicines are not cost-effective, according to standard thresholds. This challenges both the static and dynamic efficiency of pharmaceutical spending and raises questions about the best ways to align societies' interests with those of pharmaceutical companies and investors.

Notes

1. *Retail pharmaceuticals* are delivered to patients via community pharmacies and other retail outlets. Pharmaceuticals are also consumed in other care settings – primarily the *hospital* sector – where by convention the pharmaceuticals used are considered as an input to the overall service treatment and not separately accounted. That said, health accounts do allow for an additional reporting item to report a *total pharmaceutical* spending estimate covering all modes of provision. Currently only about one-third of OECD countries submit such figures.
2. Specialty medicines include most injectable and biologic agents used to treat complex conditions such as rheumatoid arthritis, multiple sclerosis and cancer and often require special handling or delivery mechanisms.
3. Biologics used in the treatment of certain types of immunologic and inflammatory diseases, including rheumatoid arthritis, psoriasis, Crohn's disease, and ulcerative colitis.
4. *https://www.mskcc.org/research-areas/programs-centers/health-policy-outcomes/cost-drugs*.
5. Orphan drugs refer to medicines developed for rare conditions. The United States and the European Union have implemented policies to encourage private investments in R&D for rare diseases (e.g. increased market exclusivity) and have consequently defined criteria to be met by a medicine to be granted an "orphan drug status". In the European Union, those criteria are: the severity of the disease; the fact that it serves an unmet need; and either prevalence below one in 2 000 or a negative expected return on investment.
6. IMS data report market sales at ex-manufacturer prices and do not reflect off-invoice discounts and rebates (IMS Institute for Healthcare Informatics, 2014). By contrast, pharmaceutical spending, as reported in the System of Health Accounts, are estimated at retail prices (including VAT) and are in principle net of off-invoice discounts and rebates. Both sets of data are not directly comparable but are expected to show more or less consistent trends.

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